

Grünecker, Kinkeldey, Stockmair  
& Schwanhäusser  
Anwaltssozietät

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> : E04F 15/10, D21J 1/08	A1	(11) International Publication Number: WO 95/06176	(43) International Publication Date: 2 March 1995 (02.03.95)
--	----	---	---

(21) International Application Number: PCT/NL94/00201

(22) International Filing Date: 24 August 1994 (24.08.94)

(30) Priority Data:  
9301469 24 August 1993 (24.08.93) NL

(71)(72) Applicants and Inventors: VAN GULIK, Menno [NL/BE]; Heuvelstraat 2, P.O. Box 6, B-Lanaken (BE). MENTZEN, Robert, Bartholomeus [NL/NL]; Theodor Schaepmakersstraat 4, NL-6221 VZ Maastricht (NL). EYMAEL, Jozef, Hendrik, Catharina, Maria, Gerardus [NL/NL]; Witmakersstraat 6, NL-6211 JB Maastricht (NL).

(74) Agent: DE BRUIJN, Leendert, C.; Nederlandsch Octrooibureau, Scheveningseweg 82, P.O. Box 29720, NL-2502 LS The Hague (NL).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD).

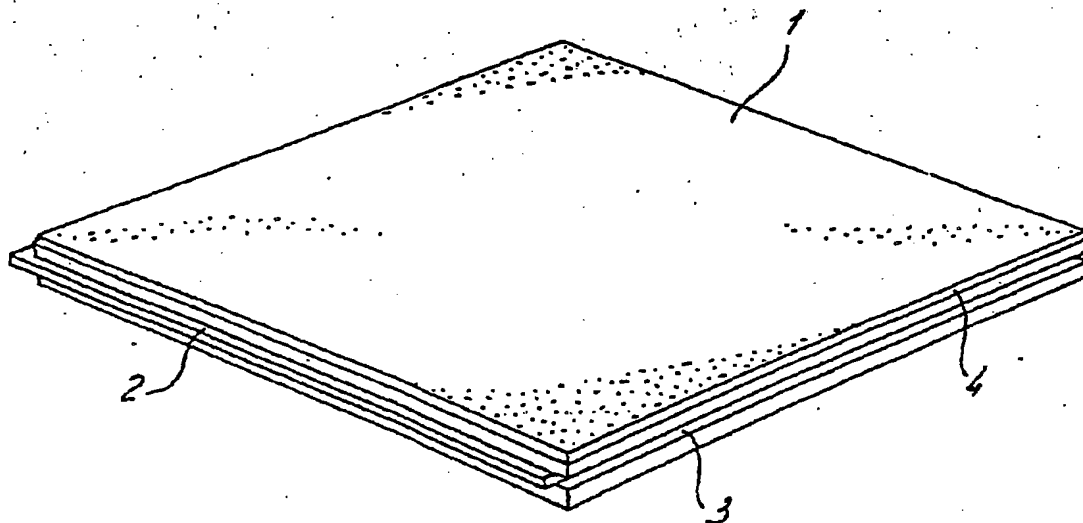
Published

*With international search report.*

*Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

*In English translation (filed in Dutch).*

(54) Title: FLOOR ELEMENT



(57) Abstract

The invention relates to a floor element for covering a base in which the bearing surface consists of a wood fibre board which is covered with a transparent lacquer coating at least on said bearing surface. This floor element can be laid together with other such floor elements on a flat base to form a floor, by joining the elements together by the side edges. The floor element is very durable through the fact that it undergoes less delamination under the effects of moisture and is more scratch-resistant and hard-wearing. Furthermore, the floor element has a very attractive, natural-looking appearance.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

FLOOR ELEMENT

The invention relates to a floor element for covering a base, which floor element comprises a wood fibre board. This floor element can be laid together with other such floor elements on a flat base to form a floor, by joining the elements together by the side edges.

Such a floor element is known from Dutch Patent Application NL-A-9000342. This known floor element comprises a carrier board, consisting of two wood fibre boards, and a hard, hard-wearing and scratch-resistant plastic sheet thereon as the bearing surface. Bearing surface in this case should be understood as the surface of the floor element facing away from the base. The carrier board and plastic sheet are bonded together with adhesive. The floor elements can be joined together to form a floor by providing them at the side edges with tongues and grooves which fit into each other. A floor made up of such floor elements, consisting of a carrier board and a plastic sheet, is known as a laminated parquet floor.

A disadvantage of the known floor element is that when it is exposed to fluctuating temperature and air humidity, and in particular when it is in direct contact with moisture, the floor element can become warped, and the plastic sheet can become detached from the fibre board (delamination). As a result of this, bulges occur relatively quickly at the side edges of the floor element in particular, which means that in use uneven wear of the plastic layer occurs, which therefore means that the appearance of the floor becomes unattractive. Owing to these effects, the service life of a floor made from the known floor elements is often undesirably limited. In practice, in order to lessen this disadvantage, people are therefore generally advised that when laying the floor elements to form a floor they should apply an adhesive between the tongues and the grooves of the adjacent floor elements. The disadvantage of this is that the floor elements cannot be removed again without damaging them, for example when moving house. Another major disadvantage of the known floor elements is that a plastic sheet is artificial, i.e. unnatural, in appearance.

The object of the invention is to provide floor elements in which the abovementioned disadvantages are less apparent.

This object is achieved according to the invention through the fact that the floor element has a bearing surface consisting of a wood fibre board which is covered with a transparent lacquer coating at least on said bearing surface.

It has been found that the floor element according to the invention can readily withstand exposure to fluctuating air humidity and temperature. It has also, surprisingly, been found that the floor element according to the invention very satisfactorily meets the high standards which are set for  
5 floors in practice without the use of a hard plastic sheet. This is particularly surprising because wood fibre boards per se have been known for a long time now and have already been in use for a fairly long time as carrier boards in floor elements. A possible explanation for the good properties of the floor element may be that, when applied to the wood fibre  
10 board of the bearing surface, the transparent lacquer, through its absorbent action, does not simply lie on the wood fibre board, but can also penetrate there to a certain depth into the board. A reinforcement of the top layer of the wood fibre board and very good adhesion of the lacquer coating to the wood fibre board are obtained as a result.

15 Due to the fact that the fibre structure of the wood fibre board remains visible through the transparent lacquer coating, the floor element according to the invention has a very attractive natural appearance which to some extent resembles natural stone. Another major advantage of the invention is that the floor element is simpler to manufacture and consequently also  
20 economically more attractive.

The floor element is preferably made entirely of wood fibre material. In this case it is possible, for example, to bond together two or more wood fibre boards, as the carrier board, and one wood fibre board, as the bearing surface, in which case tongues and grooves are formed at the side edges  
25 of the floor element through the fact that at least two essentially identically shaped wood fibre boards are lying staggered relative to each other. The wood fibre boards in the carrier board and that of the bearing surface can be different. For example, the wood fibre boards in the carrier board can be of a lower density and hardness than the wood fibre board of the  
30 bearing surface. In the most preferred embodiment the floor element consists of a single wood fibre board which at the side edges is provided with milled-in tongue and groove, and which is covered with a lacquer coating at least on its top side. The advantage of this embodiment is that the risk of delamination is reduced even further through the fact that the floor  
35 element is of an essentially homogeneous structure. A further advantage of this embodiment is that it is simpler to manufacture.

The wood fibre board is covered with a transparent lacquer coating at least on the bearing surface. The transparent lacquer coating used can in

principle be any type of transparent lacquer suitable for floors which is scratch-resistant and hard-wearing, and which is water-repellent and dirt-repellent. Such lacquers are known to the person skilled in the art. It has been found that good results can be achieved with the use of a lacquer which for hardening purposes has a relatively low viscosity when applied to the wood fibre board. A powder coating can also be applied, instead of lacquers. Such a coating can be applied in one layer in an environmentally friendly and efficient way, and produces a particularly hard-wearing coating. The attractive natural appearance of the floor element is obtained through use of the transparent lacquer coating in conjunction with the fibrous appearance of the wood fibre board. It has also been found that a transparent lacquer coating in conjunction with a wood fibre board is much more suitable for use in a floor element than a masking lacquer coating. The bearing surface of the floor element according to the invention can be coloured with a pigment. A major advantage of the floor element according to the invention relates to coloured floor elements. Owing to the relatively great absorbency of the wood fibre board of the bearing surface, when a pigment-containing liquid is applied thereto, said surface is impregnated and thus coloured over a relatively great penetration depth. This reduces the risk of the uncoloured base becoming visible through wear of or damage to the lacquer coating. Any damage to the lacquer coating and bearing surface can be repaired virtually invisible, i.e. it can be repaired without colour difference by applying a new transparent lacquer coating. The damaged place can even be lightly sanded down in this case without the uncoloured base becoming visible. The wood fibre board of the bearing surface can be coloured by treating the surface thereof first with, for example, a stain (for example, nitrocellulose stain) and then applying an uncoloured, transparent lacquer coating. The advantage of the method is that the wood fibre board is coloured to a fairly great penetration depth. The wood fibre board of the bearing surface can also be coloured in a single treatment by using a coloured, transparent lacquer coating. It is most preferable to use a wood fibre board which is already coloured completely through and through with a pigment.

The lacquer coating covers the wood fibre board of the bearing surface at least over the surface area of said bearing surface. Sufficient protection against wear is obtained in this way. Since in practice it is very difficult to join together the floor elements to form a floor with such accuracy that no open seams occur between the floor elements, the tongues

and grooves at the side edges of the floor element are also preferably provided with a lacquer coating. This minimizes the sensitivity to the action of moisture after joining together of the floor elements to form a floor, even if the floor is brought into direct contact with water. It is most preferable for the floor element to be provided with a lacquer coating on all sides. In this way it is possible to use both sides of the tile, in other words the tile can be turned over when it is worn or damaged.

A wood fibre board of relatively high density is preferably used for the bearing surface in the floor element according to the invention. The density of the wood fibre board is preferably at least  $700 \text{ kg/m}^3$ . Such boards have better mechanical properties, such as, for example, hardness and strength, than boards of lower density, such as chipboard (density  $400\text{--}500 \text{ kg/m}^3$ ). It is more preferable for the density to be at least  $800 \text{ kg/m}^3$ , and most preferable for it to be at least  $900 \text{ kg/m}^3$ . Good results can be achieved if the wood fibre board has a hardness of at least  $4000 \text{ N}$ . A high hardness means better resistance to the high pressure loads often occurring in practice (for example, from stiletto heels). The hardness is determined according to Janka. It is more preferable for the Janka hardness to be higher than  $5000 \text{ N}$ , and most preferable for it to be higher than  $6000 \text{ N}$ . Suitable types of wood fibre board are known under the name of medium-density fibre board (MDF) or high-density fibre board (HDF). Special water-resistant MDF boards are particularly suitable.

An example of a tile according to the invention is shown in the drawing.

It consists of a rectangular piece of MDF with a density of  $800 \text{ kg/m}^3$ . This tile is indicated in its entirety by 1. It is provided with a groove 2 and a tongue 3, in order to allow it to be joined to adjacent tiles.

As an example of the dimensions of the tile, a length and breadth of  $59 \text{ cm}$  can be mentioned, while the thickness can be approximately  $9\text{--}10 \text{ mm}$ .

Near the top side, the tile is provided with a bevel 4. If the tile 1 is also provided with a bevel at the bottom side, both sides of it can be used.

The tile shown here is covered on both sides with a powder coating.

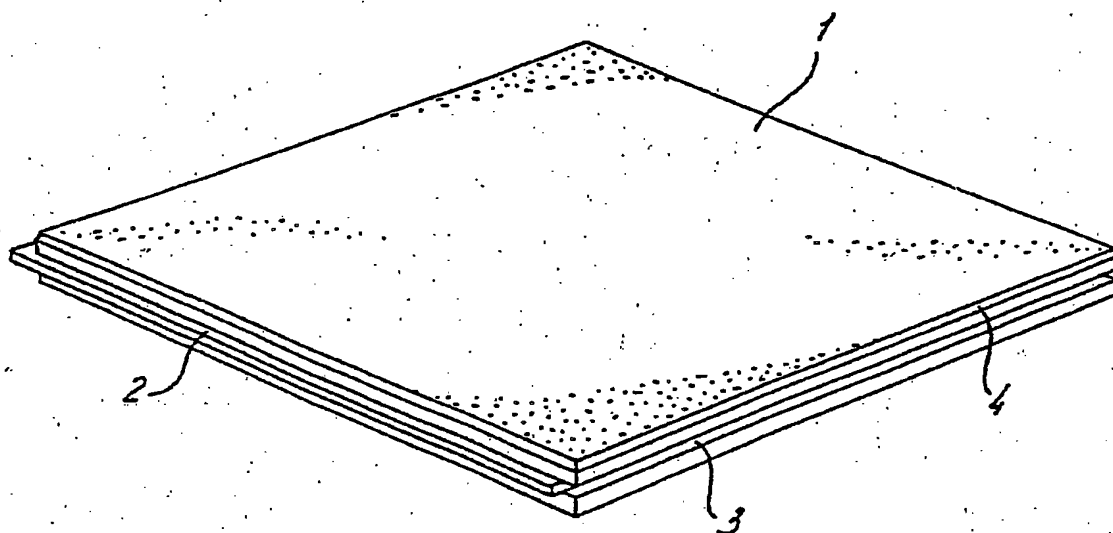
Although the invention is described above with reference to a preferred embodiment, it must be understood that numerous modifications can be made thereto. For example, the tile can be of different dimensions and in other shapes.

These and further variants are considered to lie within the scope of the appended claims.

Claims

1. Floor element for covering a base, which floor element contains a wood fibre board, characterized in that the floor element has a bearing surface consisting of a wood fibre board which is covered with an at least partially transparent lacquer coating at least on said bearing surface.
2. Floor element according to Claim 1, characterized in that the wood fibre board of the bearing surface has a density of at least 700 kg/m<sup>3</sup> and a hardness (according to Janka) of at least 4000 N.
3. Floor element according to Claim 1, characterized in that the wood fibre board of the bearing surface has a density of at least 800 kg/m<sup>3</sup> and a hardness (according to Janka) of at least 5000 N.
4. Floor element according to one of Claims 1 - 3, characterized in that the floor element consists entirely of one or more wood fibre boards.
5. Floor element according to one of Claims 1 - 4, characterized in that the floor element comprises a single wood fibre board which is provided with milled-in tongues and grooves at the side edges.
6. Floor element according to one of Claims 1 - 5, characterized in that the tongues and grooves at the side edges of the floor element are provided with a transparent lacquer coating.
7. Floor element according to one of Claims 1 - 6, characterized in that the floor element is provided with a transparent lacquer coating on all sides.
8. Floor element according to one of the preceding claims, characterized in that the transparent lacquer coating comprises a powder coating.

1/1





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NL 94/00201

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 6 E04F15/10 D21J1/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E04F B44C D21J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	FR,A,2 591 641 (MELCER) 19 June 1987 see page 1, line 9 - page 2, line 8; claims 1-3,5,6,8	1,4,5 7
X	DE,A,32 43 623 (SCHAEFFLER TEPPICHBODEN GMBH) 30 May 1984 see page 3, line 1 - line 6 see page 6, line 12 - page 9, line 20	1,4,7,8
A	DE,A,31 17 605 (GRUBER & WEBER) 25 November 1982 see page 3, line 24 - page 7, line 11; figures 1,2	1,4-7

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

7 December 1994

Date of mailing of the international search report

22.12.94.

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

AYITER, J

## INTERNATIONAL SEARCH REPORT

information on patent family members

International application No.

PCT/NL 94/00201

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-2591641	19-06-87	NONE	
DE-A-3243623	30-05-84	NONE	
DE-A-3117605	25-11-82	NONE	